



# DNBI Update

18<sup>th</sup> MEDCOM Preventive Services Directorate

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## Smallpox Disease: What We've Forgotten

### Introduction

The story of smallpox is a fascinating one that reflects the extremes of our most human nature. Evil is reflected in the enormous death toll the disease wrought through the ages, in the personal suffering caused by not only by the virus itself but also by the life-long scars carved into its victims, and in its use as a biological weapon, wiping out ancient cultures and

devastating others. Yet the massive international effort to wipe out this disease affirms all that is good in humanity: collaboration, cooperation, generosity, charity and even faith in possibilities.

The purpose of this article is to review notes of interest in the history and impact of smallpox; to discuss the disease, its symptoms and treatment; to review the eradication program and lastly, to discuss implications of an

outbreak in today's world.

### History of Smallpox

Smallpox has been known since ancient times. The disease affected all populations. Indeed, the effect of smallpox in many cultures was so profound that many developed deities to the disease. This practice was particularly common in

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## Influenza Update

Influenza cases are starting to appear in the United States and Europe.

Currently, most have been due to influenza A and B circulating strains which are covered by this season's influenza vaccine.

Several cases have been reported from Darnell Army Medical Center at Ft. Hood, Texas. The majority of personnel affected were dependent children who had not received the vaccination.

The influenza outbreak

seen in the Republic of Korea over the last two months appears to have resolved.

Taiwan has reported outbreaks of avian influenza in chickens, resulting in the slaughter of nearly 20,000 birds. The disease, caused by an H5 strain, has not yet passed into humans. A previous outbreak in 1997, caused by a different H5N1 strain, resulted in 18 ill persons and 6 human deaths. 1.4 million chickens were slaughtered to

prevent additional spread of the disease.

Units are again reminded that influenza vaccination is mandatory for all active duty personnel, including KATUSAs. Vaccinations must be recorded in MEDPROS, as well as shot records and medical records. ☸



## Smallpox

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India, China and parts of Africa.

In the years since its eradication, it is difficult to believe or to understand that prior to vaccination, almost *everyone* suffered smallpox. Peter II, czar of Russia, died of smallpox on his wedding day. He was one of several European monarchs who succumbed to the disease, altering lines of succession. Being such a common affliction, references to smallpox appeared in much common jargon. Gustave Flaubert, the French novelist, is credited with saying: Happiness is like smallpox: if you catch it too soon, it can completely ruin your constitution. And the 4<sup>th</sup> Earl of Chesterfield wrote to his son, "Love has been not unaptly compared to the small-pox, which most people have sooner or later."

European settlers introduced the disease to the Western Hemisphere. Because these populations lacked immunity, whole populations were decimated. Smallpox was also used as a bioweapon during this time; blankets

from smallpox victims were given to native peoples, triggering devastating outbreaks among them.

Washington's defeat in the Battle of Quebec has been attributed to epidemic smallpox among the troops. This led to Washington ordering the variolation (a primitive form of smallpox immunization unlike what is done today) of *all* Continental Army troops.

Periodic epidemics continued in the US. One of the last occurred in New York City in 1947. Due to the rapid immunization of over 6,000,000 people, there were only 12 cases of smallpox and only two deaths. A prior outbreak in the city in 1901 resulted in over 4,000 cases and nearly 1,000 deaths.

Finally, after nearly a decade and a half of intensive eradication efforts, in 1980 the World Health Organization announced that smallpox had been eradicated from the earth. However, scientists estimate that had smallpox **not** been eradicated, over 350

**million** cases -- roughly the combined population of the USA and Mexico -- and approximately 40 million **deaths** would have occurred in the last twenty years.

## Course of Illness

Historically, smallpox has an incubation period of approximately 12 days. The patient first develops high fever, malaise and muscle aches, followed by the appearance of a maculopapular rash. In an index (ie, first) case, this initial stage, which typically lasts 2-5 days, can easily be mistaken for other viral syndromes, including measles.

In the next day or two, the rash becomes more clearly vesicular and then pustular. Unlike chickenpox or disseminated herpetic rashes, smallpox lesions are pea-like, painful, and deeply embedded in the dermis. Also, the lesions are more concentrated distally—that is, on the face, hands, palms, feet and soles.

Typically, death occurs in this stage as a result of

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*Does he who loves someone on account of beauty really love that person? No, for smallpox, which will kill beauty without killing the person, will cause him to love the person no more.*

*Blaise Pascal (1623–1662),  
French scientist, philosopher*

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## Smallpox Vaccine

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overwhelming viremia in persons unable to mount a smallpox-specific immune reaction. Previously vaccinated persons tend to have a less serious course, with fewer lesions, milder symptoms and speedier resolution.

Pregnant women who contracted smallpox typically experienced spontaneous abortions. In pregnancies that were not aborted, the infant was stillborn, with obvious lesions on the skin.

The lesions begin to crust over and form scabs after about a week. As they heal, the lesions leave depigmented skin which often pits, leaving permanent scars. For some, ocular lesions result in permanent blindness.

### Treatment

One of the most frightening things about smallpox is that, unlike many other deadly infections, there is no specific treatment for smallpox. In general, good supportive care is required. Adjunctive medications for pain and fever control lessen the

symptoms. Some people will require more aggressive fluid and electrolyte monitoring, as well as skin care.

Death, when it occurs, is generally the result of multi-organ failure. These patients generally develop a sepsis-like picture in response to the virus. Prior immunization helps to modify the course of the disease by providing specific immune response, which reduces the likelihood of a generalized toxemia.

Recent work has suggested that the antiviral medication cidofovir, used in treating CMV retinitis, may be effective in treating smallpox. Animal studies have shown increased survival rates when treated with the drug. However, because the studies required for the Food and Drug Administration to approve cidofovir use in the treatment of smallpox are unethical, it must be used under investigational new drug protocols only.

### Prevention

Consequently, the best defense and preventive

measure against smallpox release is vaccination. While there are risks associated with the vaccine, significantly greater risks are incurred with smallpox itself. As a result, the DoD has initiated a program for vaccination of military members. Due to current limits on vaccine availability, the program will begin with the immunization of first responders and medical personnel who are likeliest to be the first involved with a smallpox case.

A key concept in containing smallpox lies in the fact that vaccination within 3 days of exposure can prevent illness. Vaccination within a week of exposure will reduce the disease severity and lessen the time to recovery.

A good pre-event vaccination program, however, depends on the careful, thorough and diligent screening of potential vaccine recipients. More information on the smallpox vaccine can be found in the previous issue of the DNBI Update. ☼



*Smallpox survivor with permanent scars*

### Additional Information:

Much good information regarding smallpox and smallpox vaccine is available on the internet. Highly recommended sites include:

<http://www.vaccines.army.mil>: contains DoD policies, guidance, forms for clinic use and much, much more.

<http://www.bt.cdc.gov/ag/ent/smallpox/index.asp>: contains extensive training and educational materials, including information on vaccine administration, normal responses, and adverse effects. ☼

## Questions and Answers About Smallpox



*Typical progression of smallpox disease in a patient who recovered*

**Q:** *What is smallpox?*

**A:** Smallpox is a serious and contagious disease caused by a virus called 'variola.' It can spread from person to person through close contact.

Smallpox can cause a severe rash and permanent scarring, high fever, severe headache and backache, blindness and possibly death.

It is possible that terrorists or governments hostile to the United States might have some of the virus. If so, they could release it as a biological weapon and cause an epidemic.

**Q:** *What's in the smallpox vaccine?*

**A:** Smallpox vaccine is made from a virus called vaccinia. Immunization with vaccinia virus keeps people from getting smallpox.

**Q:** *Who should get the vaccination?*

**A:** The first stage of the vaccine program is to immunize healthcare workers and emergency responders. Eventually most all of the military may receive the vaccine.

**Q:** *Who should not get the vaccine?*

**A:** People with eczema or atopic dermatitis, now or in the past.

People with other rashes, injuries or burns should wait until they are healed or cleared up before getting the vaccine.

Pregnant women should not get the vaccine. People with HIV and other immune system problems should not get the vaccine.

People living in the same household with someone who has any of these

conditions may need special considerations if they must get the shot.

Also, anyone who has ever had a severe allergic reaction to polymyxin B, streptomycin, chlortetracycline, neomycin, or a previous dose of smallpox vaccine should not get the vaccination.

**Q:** *What are the risks from smallpox vaccine?*

**A:** The vaccine is supposed to produce a blister at the site. Some people will develop swollen tender lymph nodes in their armpit.

Some people will have a mild fever. If you're not careful, you may spread the blisters to other body parts or to other people.

If you develop any worrisome signs, you should seek medical care.

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## 18<sup>th</sup> MEDCOM Reportable Events Program

### Selected Reportable Events Incidence Summary

NOV/DEC 2002

<b>Reportable Condition</b>	<b>Area I</b>	<b>Area II</b>	<b>Area III</b>	<b>Area IV</b>	<b>Totals</b>
Trichomonas	1	1	1	1	4
Chlamydia	29	24	29	19	101
Herpes simplex	0	0	1	0	1
Gonorrhea	3	0	6	5	14
Syphilis	2	1	1	0	4
HIV	0	0	0	0	0
STD Totals	35	26	38	25	124
Tuberculosis (active disease)	0	0	0	0	0
Tuberculosis (recent converter)	37	8	9	3	57
Heat Injury	0	0	0	0	0
Cold Injury	7	3	2	0	12

NR=None Reported

	Conditions	NOV/DEC 2002	Cum 2002	Cum 2001
STD	Chlamydia	101	466	58
	Gonorrhea	14	122	34
	Herpes Type II	1	4	3
	HIV/AIDS	0	4	
	Trichomonas	0	13	4
	Syphilis	4	5	1
Infectious Diseases	Campylobacter	1	3	0
	Cholera	0	0	0
	E.Coli 0157:H7	0	0	0
	Encephalitis	0	0	0
	Giardiasis	0	0	0
	Hepatitis A	0	1	1
	Hepatitis B	2	5	0
	Hepatitis C	0	0	0
	Influenza	0	0	0
	Measles	0	1	0
	Meningoccal Meningitis	0	0	1
	Pneumococcal Pneumonia	0	0	0
	TB, Active	0	6	2
	PPD Conversion	57	353	19
	Salmonellosis	2	9	5
	Shigellosis	0	0	0
	Typhoid Fever	0	0	0
	Varicella, adult	0	2	2
Vector-borne Diseases	Dengue Fever	0	0	0
	Ehrlichiosis	0	0	0
	HFRS	0	0	1
	Japanese Encephalitis	0	0	0
	Leptospirosis	0	0	0
	Malaria+	0	19* ROK; 22 US	12 ROK; 17 US
	Rabies	0	0	0
	Scrub Typhus	0	0	0
Injuries	Animal Bites	0	12	17
	Cold Injury	12	18	1
	Heat Injury	0	14	5
	CO Poisoning	0	0	0
	Lead poisoning	0	0	0
	Hearing Loss	0	0	0
Immunization	VAERS	0	0	1
	Influenza	0	0	0

**Notes:**

\*One case represents disease contracted outside the ROK

+ROK refers to cases diagnosed in Korea; US refers to those which developed after the soldier returned to the United States

Please refer to the reverse of the 18<sup>th</sup> MEDCOM IHO Reportable Events Worksheet for a complete listing of reportable events. This form is available at <https://www.seoul.amedd.army.mil/Pm/Forms/Reportdisform18medFeb02.pdf>.

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*Views and opinions expressed are  
not necessarily those of the 18th  
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Army*

**We're on the Web!**

*See us on the 18<sup>th</sup>  
MEDCOM Homepage!*

## Upcoming Events

### Tobacco Cessation

#### AREA I

**CRC: Feb 4, 11 & 25**  
**Casey: Feb 5, 12 & 26**

#### AREA II

**Yongsan: Feb 6, 10, 13  
& 20**

#### AREA IV

**Camp Carroll: Every  
Mon at 1300 in ACS Bldg**

**Camp Walker: Every  
Wed at 1400 at TMC**

**Camp Hialeah: Feb 20  
at 1300 at TMC**

Four-week program starts  
the first Thursday of every  
month (\*except December  
due to holidays). To  
register, call 736-3029.

### Field Sanitation Team Training

**10-14 February**  
**17-21 March**  
**702nd MSB, Cp Casey**

Reserve slots for your unit  
now!! For more  
information contact SSG  
Rivera at DSN 730-2078.

**14-18 April**  
**5th PM Detachment,  
Yongsan**

Reserve slots for your unit  
now!! For more  
information call DSN 725-  
4929.

### Food Handlers Course

**20 February**  
**27 March**

Learn proper food  
handling techniques. To  
register, contact SSG  
Rivera at DSN 730-2078.

### Nutrition Month Fun Run

15 March at 9AM  
Meet at Collier Field  
House; vest required.

## About Our Organization...

The mission of the 18<sup>th</sup>  
MEDCOM Preventive  
Services Directorate is to:  
Maintain oversight of a  
comprehensive Preventive  
Medicine Program;

promote and maintain the  
fighting force at maximum  
effective strength;  
maintain the physical well  
being of all personnel; and  
finally, to establish

practical measures for the  
preservation and  
promotion of health and  
the prevention of disease  
and injury. ☼

## Need more **FREE** CME's or CE's?

Check out the websites below!

<http://www2.cdc.gov/ce/availableactivities.asp>

<http://dod.digiscript.com/> (some users have had difficulty with the viewer; contact IMO if  
you have trouble also)